



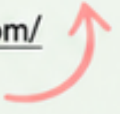
JP Maths

Revision



Attempt the paper
before watching the
solutions!

[https://www.youtube.com/
@JPMathsRevision](https://www.youtube.com/@JPMathsRevision)



HIGHER TIER

Similar Shapes (Area and Volume)



INSTRUCTIONS

- Use **black ink** or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.



INFORMATION

- The marks for **each** question are shown in brackets– *use this as a guide as to how much time to spend on each question.*



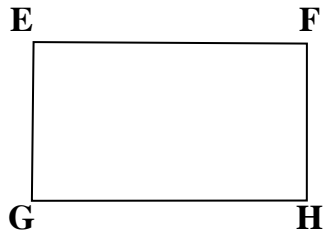
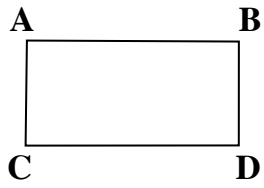
ADVICE

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.



You've got this!

1. Rectangles ABCD and EFGH are mathematically similar.



$$AC = 6 \text{ cm}$$

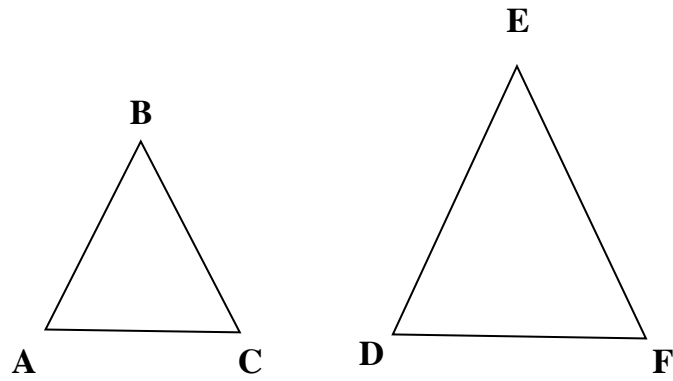
$$EG = 18 \text{ cm}$$

The area of rectangle ABCD is 12 cm^2 .

Find the area of rectangle EFGH

.....
(Total for Question 1 is 2 marks)

2. Triangles ABC and DEF are mathematically similar.



$$AC = 10 \text{ cm}$$

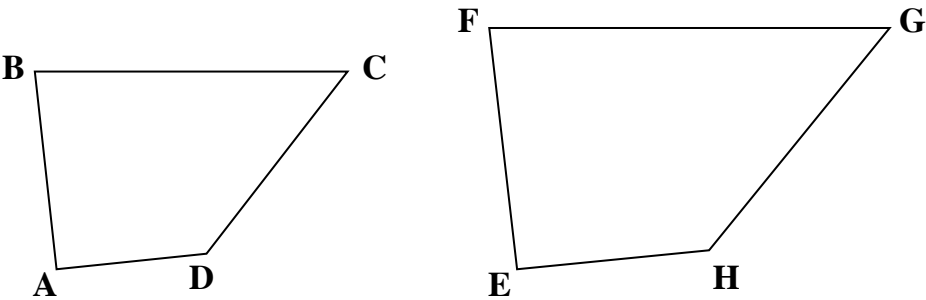
$$DF = 15 \text{ cm}$$

The area of triangle DEF is 20 cm^2 .

Find the area of triangle ABC

.....
(Total for Question 2 is 2 marks)

3. Quadrilaterals ABCD and EFGH are mathematically similar.



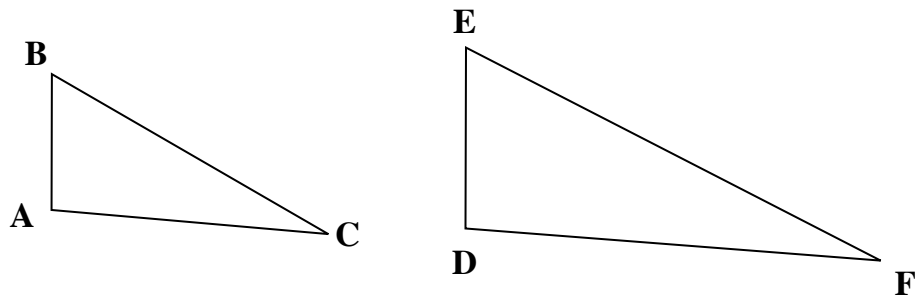
The lengths of AB and EF are in the ratio 1:5.

The area of quadrilateral ABCD is 45 cm².

Find the area of quadrilateral EFGH.

.....
(Total for Question 3 is 3 marks)

4. Triangles ABC and DEF are mathematically similar.



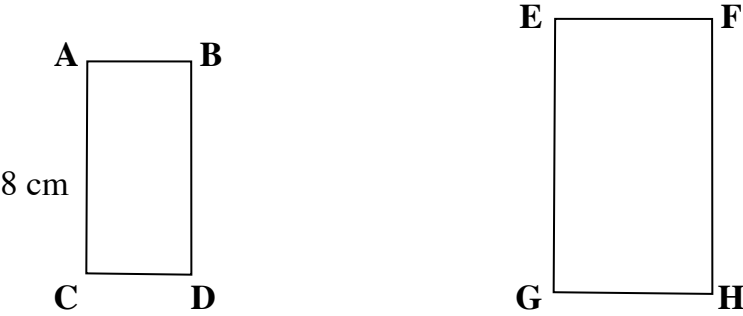
The lengths of AC and DF are in the ratio 2:5.

The area of quadrilateral DEF is 300 cm².

Find the area of triangle ABC.

.....
(Total for Question 4 is 3 marks)

5. Quadrilaterals ABCD and EFGH are mathematically similar.



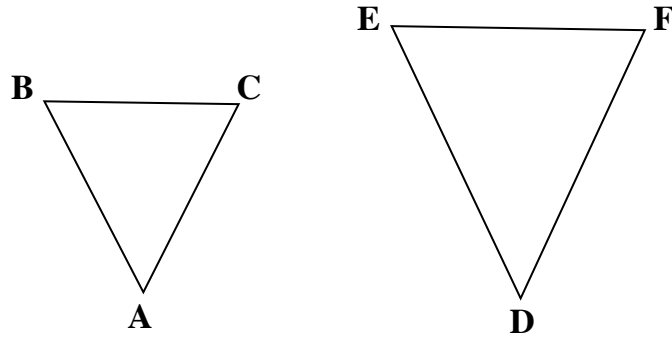
The areas of ABCD and EFGH are 64 cm² and 144 cm² respectively.

$AC = 8\text{ cm}.$

Find the length of EG

.....
(Total for Question 5 is 3 marks)

6. Triangles ABC and DEF are mathematically similar.



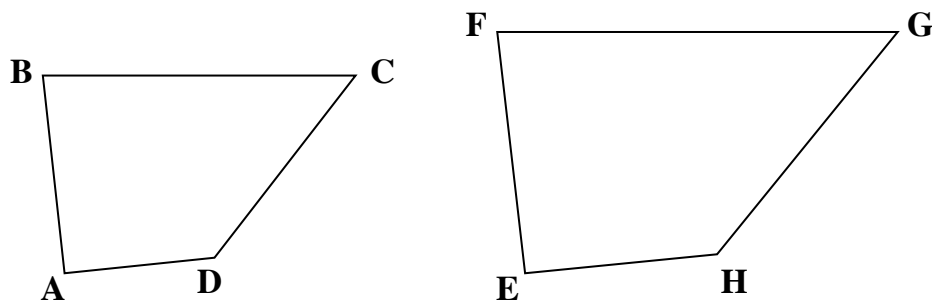
The areas of triangles ABC and DEF are 98 cm^2 and 200 cm^2 respectively.

$BC = 7 \text{ cm}$.

Find the length of EF.

.....
(Total for Question 6 is 3 marks)

7. Quadrilaterals ABCD and EFGH are mathematically similar.



The areas of ABCD and EFGH are in the ratio 25 : 49.

$AB = 15$ cm.

Find the length of EF.

.....
(Total for Question 7 is 3 marks)

8. P and Q are two similar solids.

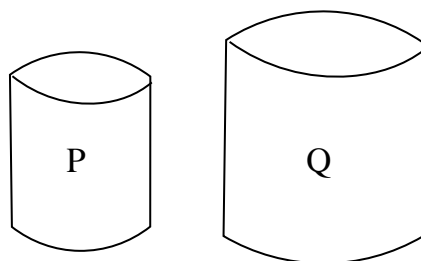
A length of P is 4 cm. A corresponding length of Q is 8cm.

Cube P has a volume of 40 cm^3 .

Find the volume of cube Q.

.....
(Total for Question 8 is 3 marks)

9. P and Q are two similar cylinders.



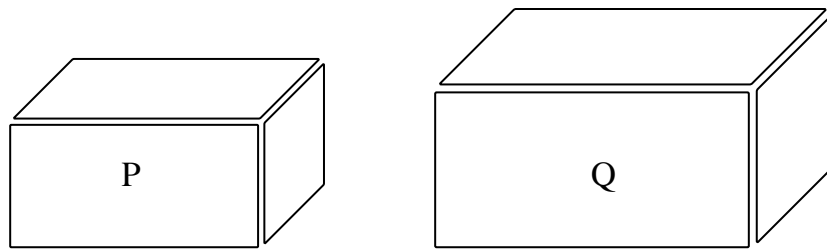
The radius of cylinder P is 2 cm. The radius of cylinder Q is 8cm.

Cylinder P has a volume of 25 cm^3 .

Find the volume of Q.

.....
(Total for Question 9 is 3 marks)

10. P and Q are two similar cuboids.



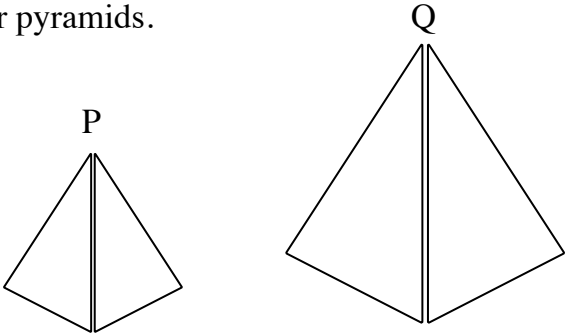
The heights of the two cuboids are in the ratio 1:4.

Cuboid P has a volume of 72 cm^3 .

Find the volume of Q.

.....
(Total for Question 10 is 3 marks)

11. P and Q are two similar pyramids.



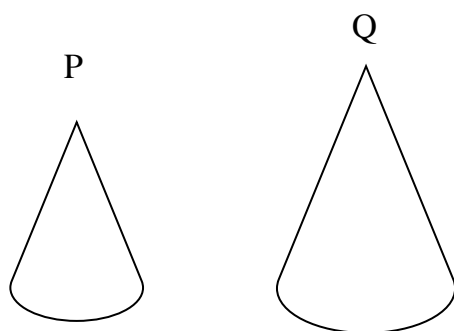
The volumes of the two pyramids are 64 cm^3 and 512 cm^3 .

The height of pyramid P is 6 cm.

Work out the height of pyramid Q.

.....
(Total for Question 11 is 3 marks)

12. P and Q are two similar cones.



The volumes of the cones are 250 cm^3 and 2000 cm^3 .

The radius of the smaller cone is 5 cm.

Work out the radius of the larger cone.

.....
(Total for Question 12 is 3 marks)

13. The surface areas of two similar solids are in the ratio 4 : 9.

Find the ratio of their volumes.

.....
(Total for Question 13 is 2 marks)

14. Two similar solids have volumes in the ratio $64 : 343$.

Find the ratio of their surface areas.

.....
(Total for Question 14 is 2 marks)

15. Two similar cones have volumes in the ratio 125 : 216.

The surface area of the smaller cone is 150 cm².

Find the surface area of the larger cone.

.....
(Total for Question 15 is 3 marks)
